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For 1955 Through 1957

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Supplement to

MINERALS OF CALIFORNIA

For 1955 Through 1957

By JOSEPH MURDOCH
University of California, *Los Angeles*

And ROBERT W. WEBB
University of California, *Santa Barbara*

with INDEX TO *MINERALS OF CALIFORNIA*
ARRANGED BY COUNTIES

Prepared by ELIZABETH COLLINS
California Division of Mines

Supplement to Bulletin 173
California Division of Mines
Ferry Building, San Francisco, 1960

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SUPPLEMENT TO MINERALS OF CALIFORNIA

FOR 1955 THROUGH 1957

By JOSEPH MURDOCH and ROBERT W. WEBB

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PREFACE

The last summary of occurrences of minerals in California was published in Bulletin 173, *Minerals of California,* by the compilers of this supplement, and included all reported occurrences through December 31, 1954. This paper constitutes additions as reported in the literature and by personal communication from January 1, 1955 through December 31, 1957.

In the 3-year period, three new minerals have been described from California: galeite (1955), gerstleyite (1956) and nekoite (1956). In addition, 23 new species have been reported for the first time, as follows:

1. Antlerite
2. Beta-uranotil
3. Carnotite
4. Cerite
5. Connellite
6. Cuprosklodowskite
7. Deweylite
8. Ecdemite
9. Ginorite
10. Hambergite
11. Kasolite
12. Kurnakovite
13. Leonhardite
14. Linnaeite
15. Metatorbernite
16. Metazeunerite
17. Plombierite
18. Sabugalite
19. Schroeckingerite
20. Terlinguaite
21. Tyuyamunite
22. Uranophane
23. Zippeite

Hillebrandite has also been re-established as a valid species from the state.

Crestmore, Riverside County, continues to supply new minerals and additional species. An additional reference summarizing mineral discoveries in historical perspective is Jenni (1).

The glaucophane schists, prominent in Coast Ranges geology, yield new and interesting occurrences. Watters (2) lists 38 minerals associated in glaucophane schist localities.

Uranium and rare-earth minerals have multiplied in their reported frequency as might have been predicted. It is noteworthy that autunite, for example, was reported from five localities in three counties in Bulletin 173; it is now known from 25 localities in 10 counties. Carnotite was unreported in Bulletin 173; it is now entered from 14 localities in 9 counties. In addition, at least 15 of the 27 minerals new to California are radio-active or rare-earth minerals. References Anonymous (34) and G. W. Walker et al. (5) summarize new localities.

Numerous requests for a listing of California's minerals by counties have resulted in several county indices of the minerals. Rita Matson of the Santa Barbara Mineral and Gem Society, Box 815, Santa Barbara, California, and Professor Donald O. Emerson, University of California, Davis, have prepared county indices of the minerals; these may be obtained from the compilers. The index used in this supplement was compiled by Elizabeth Collins of the California Division of Mines.

Any errors, inaccuracies, or suggestions concerning either this supplement or the Bulletin will be gratefully received. Comments may be addressed to either Joseph Murdoch or Robert W. Webb, or to the State Division of Mines.

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March 15, 1959

DESCRIPTION OF MINERALS AND MINERAL LOCALITIES

ALLANITE

Inyo County: **1**, Coarse grained allanite occurs in a pegmatite, about 4500 ft. S. 30° W. of Jackass Spring, on Hunter Mt., Ubehebe quadrangle, McAllister (4) p. 52.

Los Angeles County: **1**, Additional reference, Patchick (2) p. 237. This reference gives detailed location diagrams.

AMPHIBOLES

ACTINOLITE

San Bernardino County: **3**, Additional locality in alluvium, near Wrightwood, reported by Berkholz (16) p. 21.

HORNBLENDE

Inyo County: **1**, In large prismatic crystals up to 2.5 inches long in pegmatite near Little Dodd Spring, Panamint Range, McAllister (4) p. 52.

San Bernardino County: **2**, Pargasite variety of hornblende occurs in coarsely crystalline masses in a diorite pegmatite, 4 miles southeast of Camp Irwin in the Mojave Desert (SE$\frac{1}{4}$ sec. 11, T. 13 N., R. 3 E., S. B.), Allen and Kramer (3) p. 527.

TREMOLITE

Calaveras County: **1**, Slip-fiber veins of amphibole asbestos are common in basic rocks in the Calaveritas quadrangle. Hand specimens with fibers up to 2 inches were collected 200 ft. west of the triangulation station (SW$\frac{1}{4}$ sec. 1, T. 3 N., R. 13 E., M. D.) L. D. Clark (1) p. 17.

Inyo County: **2**, As radial clusters near Lippincott mine, Ubehebe district, McAllister (4) p. 52.

SODA AMPHIBOLES

CROSSITE

Orange County: **1**, Crossite has been found abundantly in the San Onofre breccia at Dana Point, Jenni (p.c. '57).

GLAUCOPHANE

Marin County: **3**, An outcrop of glaucophane schist with abundant yellowish epidote has been observed on the north side of Tiburon Peninsula, Watters (p.c. '58).

Mendocino County: **1**, A quarry 5.1 miles north of Longvale on U.S. 101 has furnished glaucophane schist with associated lawsonite, stilpnomelane, and riebeckite, Watters (p.c. '58).

RIEBECKITE

Mendocino County: **2**, Patches of prismatic riebeckite crystals occur in glaucophane schist in a quarry 5.1 miles north of Longvale on Highway 101, associated with stilpnomelane and lawsonite, Watters (p.c. '58).

ANALCIME—Analcite

Los Angeles County: **5,** A specimen of analcime crystals perched on a drusy crust of bakerite has been collected from the Stirling Borax mine, Tick Canyon, Pemberton (p.c. '58). This is an unusual mode of occurrence for this mineral.

San Bernardino County: **1,** Analcime was observed in a single poor specimen from the Calico Mts., A. R. Palmer (1) p. 241.

ANDALUSITE

Imperial County: **1,** Excellent crystals of andalusite in mica schists were discovered in a lens as pale brown crystals at the Foster Bluebird mine 3 miles north of the abandoned station of Ogilby on the Southern Pacific Railroad, in the Cargo Muchacho Mts., Robert K. Foster (p.c. '58).

Inyo County: **1,** The variety chiastolite occurs widely in the Rest Spring shale. An accessible occurrence is along San Lucas Canyon, near junction with the road to Cerro Gordo mine, McAllister (4) p. 53.

Mariposa County: **3,** Colorless to pink glassy crystals 3-6 mm by 20 mm occur in slates (SW¼ sec. 17, T. 6 S., R. 16 E., M. D.) in what is known as the Southwest of Three Buttes deposit. It is undeveloped, Bowen and Gray (2) p. 202. **4,** Occurs in pegmatites at May Lake, Yosemite National Park, R. L. Rose (1) p. 635.

ANTLERITE
$Cu_3(SO_4)(OH)_4$

Orthorhombic. Crystals usually thick tabular, also equant or short prismatic. Cross fiber veinlets, felt-like, granular. Cleavage, one perfect. Brittle. H. = 3½. G. = 3.88. Luster vitreous. Emerald- to blackish-green. Streak pale green. Soluble in dilute H_2SO_4.

A secondary mineral found in the oxidized zone of copper deposits in arid regions.

Shasta County: **1,** Reported as coatings in fractures from the Old Mine ore body, Kinkel et al. (2) p. 89.

ARAGONITE

Inyo County: **4,** White to colorless crystals as much as half an inch in length line fissures in some of the workings of the Lippincott mine, McAllister (4) p. 53.

San Luis Obispo County: **1,** Reported in a road cut on state highway 466, 6.9 miles from Morro Bay, Berkholz (15) p. 25, (S.M.B. 21586).

ARSENOPYRITE

Riverside County: **3,** Excellent crystals of arsenopyrite have been collected from a prospect hole near the old Good Hope mine west of Perris, Knowlton (p.c. '57).

AUTUNITE

Imperial County: **1,** Reported as autunite or torbernite from a prospect 10 miles NE of Glamis, in metamorphic rocks, G. W. Walker et al. (5) pp. 10, 26.

Inyo County: **1,** New information on the occurrence reported in Bull. 173 as Green Valley claim, shows claim to be the "Green Velvet", and to have autunite coating conchoidal fracture surfaces in light gray

clay, in beds of clay and tuffaceous sandstone, G. W. Walker et al. (5) pp. 10, 35. **2**, From near Olancha (S. M. B. 21634).

Kern County: **1**, Additional data confirm the identity of this occurrence as the Chilson property in the Summit Range, 6 miles north of Randsburg (sec. 36 (?), T. 28 S., R. 40 E., M. D.). The autunite occurs as yellow crystals on joint surfaces and in small cavities in Red Mt. volcanics, with torbernite, G. W. Walker et al. (5) p. 19. **4**, Reported in iron oxides from the Bluett property (NE¼ sec. 9, T. 10 N., R. 13 W., S. B.), G. W. Walker et al. (5), p. 17. **5**, With gummite (?), iron and manganese oxides, quartz and clay in a fault zone 6 miles SSE of Tehachapi (Buster Tom claims, sec. 8, T. 11 N., R. 14 W., S. B.) G. W. Walker et al. (5) p. 17. **6**, Found 1½ miles west of the Miracle mine and 3 miles west of Miracle Hot Springs (sec. 25 (?), T. 27 S., R. 31 E., M. D.). The autunite is carried in an iron-stained breccia zone, and is similar to the autunite from the Miracle mine. The prospect is known as the Wayne Case property, G. W. Walker et al. (5) p. 30. **7**, From the Kergon group of claims (sec. 20, T. 27 S., R. 32 E., M. D.) with fluorite and a molybdenum-bearing mineral in faults and fractures in granodiorite, G. W. Walker et al. (5) pp. 11 and 30. **8**, From Kervin claim, near Penyon Creek, S. M. B. (21611), in minor amounts. Material occurs in a shear zone on a granite-metasedimentary contact, 9½ miles SE of Weldon (sec. 23, T. 27 S., R. 35 E., M. D.), with torbernite, G. W. Walker et al. (5) p. 31. (S. M. B. 21612). **9**, Autunite sparsely coats fracture surfaces in altered rhyolite in the Middle Butte mine, 8 miles SW of Mojave (sec. 16, T. 10 N., R. 13 W., S. B.), in a former gold mine, G. W. Walker et al. (5) p. 17. **10**, Autunite was found, after an aerial survey of the Mojave Mining district where an anomaly appeared in section 10. A shaft was sunk in which autunite coatings were found on fracture surfaces in an andesite porphyry dike and in quartz monzonite. G. W. Walker et al. (5) p. 15. **11**, The mineral has been identified from the Stillwell property (sec. 35, T. 10 N., R. 13 W., S. B.), 5 miles NW of Rosamond, G. W. Walker et al. (5) p. 15. **12**, Surprise claim, near McKittrick (S. M. B. 21649, and S. M. B. 21631). This property is briefly described by G. W. Walker et al. (5) p. 33 (sec. 3, T. 30 S., R. 21 E., M. D., called Surprise No. 1 claim), as carrying "honey-yellow secondary uranium minerals" but the identity as autunite is not confirmed. **13**, Reported as meta-autunite, coating fractures in granodiorite in the Verdi Development Company property (sec. 36, T. 10 N., R. 13 E., S. B.), G. W. Walker et al. (5) p. 15 **14**, Found with gummite (?) in fractures in rhyolite, at the Jumpin claim: (sec. 9, 10, T. 9 N., R. 13 W., S. B.), 5½ miles WNW of Rosamond, G. W. Walker et al. (5) p. 15. **15**, From Breckinridge area (S. M. B. 21612).

Lassen County: **1**, From Siskon Mining Lease near Doyle (S. M. B. 21658).

Los Angeles County: **1**, Autunite with other secondary uranium minerals occurs as fracture coatings in deeply weathered granite in the Rafferty property, 25 miles east of Lancaster (sec. 26, T. 7 N., R. 8 W., S. B.), G. W. Walker et al. (5) p. 20.

Riverside County: **1**, From Joanna No. 2 mine, near Blythe (S. M. B. 21628).

San Bernardino County: **2**, From near Barstow (S. M. B. 21647). **3**, Reported, probably with carnotite, as coatings and fractures in lake beds from the Harvard Hills (T. 10 N., R. 3 E., S. B.), 9 miles east of Yermo, G. W. Walker et al. (5) p. 20. It is probable that localities **2** and **3** are the same.

San Luis Obispo County: **1**, From the Wakefield property near Pozo (S. M. B. 21623). **2**, From near Fellows (S. M. B. 21651). **3**, From Sunset claim, near Taft (S. M. B. 21648). **4**, From the Geeslin and Fiscus property, 3 miles SSW of Taft, with secondary uranium minerals as coatings on siltstones and shale, (sec. 34 (?), T. 32 S., R. 23 E., D. M.) G. W. Walker et al. (5) p. 34.

Trinity County: **1**, Reported from the county (S. M. B. 21622).

Tuolumne County: **1**, From Sonora Pass area, (S. M. B. 21644).

AXINITE

Inyo County: **2**, Additional data from McAllister (4) p. 53 on this locality suggests ". . . Butte Valley is another name for Hidden Valley . . . the locality of the later find is perhaps the same . . . but is probably not at Ubehebe mine, which is 6 miles toward the northwest and in other mountains." **4**, Coarse-grained axinite occurs in calcite marble very near a contact with intrusive quartz monzonite, west of Hidden Valley, as purplish aggregates of platy crystals up to an inch in length, McAllister (4) p. 53.

B-LEONHARDITE

See laumontite

BAKERITE

General reference: Kramer and Allen (5).

Los Angeles County: **1**, Also, well-formed minute crystals of bakerite of two distinct crystal habits have been found associated with howlite masses at the Sterling Borax mine, Tick Canyon, Murdoch (p.c. '57).

BARITE

Inyo County: **4**, Additional references: Tucker and Sampson (25) p. 481; Bateman (3) p. 83. **11**, Coarse-grained barite is reported by McAllister (4) p. 53 from a vein up to 1 foot in thickness, 1400 feet S. 85° W. of the high point of a ridge behind the Lippincott mine.

BASSANITE

San Bernardino County: **2**, Reported in X-ray analyses of fossiliferous nodules from the Calico Mts., A. R. Palmer (1) p. 241.

BERYL

Riverside County: 5, Beryl, some of it aquamarine, has been collected from the S. P. Silica quarry near Nuevo, Knowlton (p.c. '57).

BETAFITE

San Bernardino County: **1**, Additional reference, G. W. Walker, et al. (5) p. 21.

BETA-URANOTIL
$CaO \cdot 2SiO_2 \cdot 2UO_3 \cdot 6H_2O$

Monoclinic (?), habit needle-like; G. = 3.9. Color yellow-green; H. = very low; luster silky-vitreous. Soluble in acids.

Inyo County: **1**, From the county (S. M. B. 21645).

BIEBERITE

San Luis Obispo County: **1**, Occurs as an alteration of linnaeite in the Klau quicksilver mine. Santa Lucia Range (sec. 33, T. 26 S., R. 10 E., M. D.) Woodhouse and Norris (6) p. 114.

BIOTITE

Kern County: **1**, Biotite in a pegmatite in granite appears to be radioactive, and is under claim as The Dancing Devil No. 16, (sec. 23, T. 27 S., R. 31 E., M. D.) 7 miles west of Miracle Hot Spring, G. W. Walker et al. (5) p. 30.

BISMUTH

Kern County: **1**, Knowlton (p.c. '57) reports a specimen of native bismuth from a locality between Jawbone Canyon and Havilah.

BRANNERITE

San Bernardino County: **1**, This rare mineral is reported as nodular masses in biotite in granitic gneisses, and in shear zones in the gneiss, associated with several other uncommon minerals, including euxenite in very minor amounts, from a canyon on the north side of the San Bernardino Range, near Old Woman Springs (app. sec. 22, T. 3 N., R. 3 E., S. B.), Hewett, et al. (4) p. 30.

BULTFONTEINITE

Riverside County: **1**, Additional reference, Murdoch (32) p. 900.

CALCIOCARNOTITE
See tyuyamunite

CAPORCIANITE
See laumontite

CARNOTITE
$K_2(UO_2)_2(VO_4)_2 \cdot 3H_2O$

Orthorhombic or monoclinic (?)—occurs as a powder or loosely coherent micro-crystalline aggregates. One perfect cleavage; luster dull to pearly or silky; color bright yellow to lemon yellow, greenish yellow.

Occurs chiefly as cementing material in sandstones or locally as small pure masses around carbonized tree trunks or other vegetal matter.

El Dorado County: **1**, From near Placerville (S. M. B. 21635).

Imperial County: **1**, Reported by G. W. Walker et al. (5) p. 10, 26, to occur in a metamorphic terrane intruded by felsic dikes and plugs. The carnotite is in the altered felsic rocks associated with torbernite or autunite, in talc-bearing metamorphic rocks. The locality is 10 miles northeast of Glamis (sec. 36 (?), T. 12 S., R. 19 E., S. B.)

Kern County: **1**, Carnotite is found in thin-bedded sandy limestones at the Fiend claim (sec. 15, T. 9 N., R. 6 W., S. B.) on the south end of the Kramer Hills, G. W. Walker et al. (5) p. 20. **2**, Reported with opal as fracture coatings in sandy clay of the Ricardo formation in the Vanuray claim 2½ mi. NW of Boron (sec. 26, T. 11 N., R. 8 W., S. B.)

G. W. Walker et al. (5) p. 19. **3,** From Loperna property near McKittrick (S. M. B. 21614). This property is described by G. W. Walker et al. (5) p. 33 (sec. 2, T. 30 S., R. 21 E., M. D.) but the yellow coatings on fractures in altered and brecciated shale are called "secondary uranium minerals," and the identity as carnotite is not confirmed. **4,** From Knoll prospect, Verdi Development Company, Rosamond (S. M. B. 21632).

Lassen County: **1,** From Madonna Mia group near Chilcoot (S. M. B. 21650).

Mono County: **1,** From near Masonic (S. M. B. 21624).

Monterey County: **1,** From Pennington claim, near Parkfield (S. M. B. 21615 and 21616).

Nevada County: **1,** From the Easter mine, near Floriston (S. M. B. 21657).

Riverside County: **1,** From near Desert Center (S. M. B. 21627).

San Bernardino County: **1,** From near Amboy (S. M. B. 21641). **2,** Found with copper minerals in the Jeep No. 2 claim 6 miles NW of Clark Mt. Peak (sec. 10, T. 17 N., R. 12 E., S. B.) G. W. Walker et al. (5) p. 22. **3,** Prospects in the Kramer Hills (secs. 12, 14, T. 9 N., R. 6 W., S. B.) carry yellow stains of carnotite, G. W. Walker et al. (5) p. 19. It is likely that localities represented by S. M. B. *21609* and *21652* are identical with this locality.

CERITE

Near $2Ce_2O_3 \cdot 3SiO_2 \cdot 3H_2O$

Orthorhombic—crystals rare; commonly massive, granular. No cleavage; brittle. H = 5.5 G = 4.86; luster dull adamantine to resinous; color clove-brown to cherry-red; streak grayish white. Gelatinizes with HCl.

San Bernardino County: **1,** Cerite is reported with bastnaesite from the Mountain Pass deposit 30 miles east of Baker, Glass, et al. (4) p. 665. The crystallography of this occurrence has been presented by Gay (1) p. 429.

CERVANTITE

San Benito County: **1,** Coatings on stibnite and matrix are found in a specimen from the Ambrose mine near Hollister, collected about 1900, and in the collection of Rocks and Minerals Magazine in Peekskill, New York, Anon. 31, p. 575.

CHALCEDONY

See quartz

CHALCOPYRITE

Shasta County: **1,** Additional reference, Kinkel et al. (2).

Trinity County: **5,** Additional reference, Stinson (1).

CHROMITE

Additional References:

Calaveras and Amador Counties: Cater (3).

Del Norte County: F. G. Wells et al. (5).

El Dorado County: Cater et al. (4); W. B. Clark and Carlson (3).

Mariposa County: O. E. Bowen and Gray (2).

Siskiyou County: F. G. Wells and Cater (6).

Southern Coast Ranges: G. W. Walker and Griggs (4).

Monterey County: **1,** Goldsmith (1) p. 348, (2) p. 365, and (5) p. 152 described *trautwinite* as a new mineral, but it appears to be a mixture of uvarovite garnet and chromite.

Riverside County: **1,** Approximately one ton of chromite is reported as having been taken from the New City quarry, Victoria Ave., Riverside, Knowlton (p.c. '57).

CINNABAR

Marin County: **1,** Cinnabar was discovered in pods of fine-grained material in sandstone on the M. Gambonini Ranch on Salmon Creek, about 6 miles east of Marshall. Placer and float in abundance in Salmon Creek and tributaries resulted in the lode discovery and some exploration was undertaken, Ver Planck (3) p. 263.

San Luis Obispo County: **2,** Small crystals of cinnabar occur sparingly, perched on marcasite needles, in the Klau quicksilver mine, Santa Lucia Range (sec. 33, T. 26 S., R. 10 E., M. D.) Woodhouse and Norris (6) p. 114. **3,** From the Madrone mine, (S. M. B. 21670).

San Mateo County: **1,** Additional reference, F. F. Davis (7) p. 415. **2,** With mercury and metacinnabar, and possibly terlinguaite from the Emerald Lake mine near Redwood City (S. M. B. 21669).

COBALTITE

Inyo County: **1,** Cobalt minerals are disseminated in small quantities in the metamorphic rocks of Chocolate Peak on the South Fork of Bishop Creek, near Bishop. The only established occurrence of cobaltite is on the west side of Chocolate Peak, 500 ft. east of Long Lake. Associated are pyrrhotite, chalcopyrite, arsenopyrite, and pyrite; gossans carry erythrite, Bateman (3) p. 83.

CONNELLITE
$Cu_{19}(SO_4)Cl_4(OH)_{32}\cdot 3H_2O$?

Hexagonal, acicular, longitudinally striated; radiated groups of needles, felted aggregates. H. = 3. G. = 3.36; luster vitreous; color fine azure blue; streak pale greenish blue; brittle.
Easily fusible; affords much acid water in closed tube. Soluble in acids or ammonium hydroxide.

Madera County: **1,** Radiating groups of blue-green acicular crystals occur up to 5 mm in diameter. Found on cleavages of gray schist near Buchanan copper mine, 5 miles northeast of Daulton by Ed Oyler, Crippen (p.c. '57).

COPIAPITE

Shasta County: **1,** Reported as probably found in the gossan at the Iron Mountain mine, Kinkel et al. (2) p. 89.

CORUNDUM

Mariposa County: **1,** Occurs in pegmatite with andalusite from May Lake, Yosemite National Park, Rose (1) p. 635.

CUPROSKLODOWSKITE
$CuO\cdot 2UO_3\cdot 2SiO_2\cdot 6H_2O$

Orthorhombic; habit acicular radial; color yellowish green; H. = 3, G. = 3.5; luster vitreous.

Plumas County: **1,** Reported from Chilcoot area (S.M.B. 21610).

CUPROTUNGSTITE

Inyo County: **1,** Reported as a replacement of scheelite as light olive-green to greenish yellow coloration in fractures in scheelite from the Cuprotungstite claim, 1.3 mi. N. 16° E. of Big Dodd Spring, Ubehebe district, McAllister (4) p. 55.

CYRTOLITE

San Bernardino County: **1,** Additional reference, G. W. Walker et al. (5) p. 21.

DAVIDITE

"Davidite" is mentioned on occasion in connection with reported radioactive mineral occurrences in the state. According to Dana (6) p. 542, it is ". . . apparently a mixture, largely ilmenite, magnetite, rutile, and a rare-earth mineral near chevkinite."

DEWEYLITE

A magnesian silicate near serpentine, but with more water.
Perhaps $4MgO \cdot 3SiO_2 \cdot 6H_2O$

Amorphous, and having much resemblance to gum arabic or opal.
Brittle and often much cracked.
Gives off much water in closed tube. Decomposed by HCl.

Riverside County: **1,** An opaline mineral closely resembling deweylite in X-ray pattern has been found on the 910 level of the Commercial quarry at Crestmore, Murdoch (p.c. '57). Some of the mineral forms an alteration zone around crude merwinite crystals.

ECDEMITE—Heliophyllite

$Pb_4As_2O_7 \cdot 2PbCl_2(?)$

Tetragonal, in small tabular crystals; cleavage, basal distinct; H. = 2½-3; G. = 7.14; luster vitreous to greasy; color bright yellow to green; transluscent in thin splinters.
Easily fusible to a yellow mass; soluble in HNO_3.

Inyo County: **1,** Reported by Woodhouse (p.c. '56) as an alteration of mimetite from the Defense mine in the Inyo Range.

EPIDOTE

Marin County: **2,** Epidote occurs as yellowish, fairly well-formed crystals in glaucophane schist on the north side of Tiburon Peninsula, Watters (p.c. '58).

EPSOMITE

Los Angeles County: **2,** Epsomite occurs as minute crystals and fine-grained efflorescences near the base of the sea cliffs at Castellamare, McGill (p.c. '57).

San Luis Obispo County: **1,** Reported as an alteration associated with morenosite, bieberite, and other hydrous sulfates from the Klau quicksilver mine, Santa Lucia Range (sec. 33, T. 26 S., R. 10 E., M.D.) Woodhouse and Norris (6) p. 114.

ERYTHRITE

Inyo County: **1,** Additional reference, Bateman (3) p. 83.

EUXENITE

Kern County: **1,** A mineral closely resembling euxenite has been found in a pegmatite in the Piute Mountains, 15 miles south of Weldon, Proctor (p.c. '56).

San Bernardino County: **1,** Additional reference: Hewett, et al. (4) p. 30.

FEATHER ORE
See jamesonite

FOSHAGITE

Riverside County: **1,** Foshagite is now considered to be a valid species, different from hillebrandite, Hiller and Taylor (1) p. 53.

* GALEITE, 1955
$Na_2SO_4 \cdot Na(FCl)$

Hexagonal rhombohedral, small nodular aggregates in saline clays; minute crystals are hexagonal, barrel shaped; G. = 2.6; H. = 2-3 (?); luster vitreous; colorless, white.

San Bernardino County: **1,** A new mineral from Searles Lake, found in drill cores of the lake section in small nodular aggregates of minute crystals, embedded in clay and other salt minerals, Pabst et al. (15) p. 1658.

GARNET

Inyo County: **6,** Crystals of brown grossularite showing the unusual form 210 have been collected near Bishop, Knowlton in Trainer (4) p. 811.

Los Angeles County: **1,** Almandite in well-formed crystals up to 4 cm across occur in a biotite-chlorite schist in a road cut of the Angeles Crest Highway near Georges Gap, Murdoch and Webb (6) p. 351. (This is incorrectly entered under Kern County, as **2,** in both Bulletins 136 and 173).

GARNIERITE

Del Norte County: **1,** Garnierite occurs as veins in serpentine associated with laterite at Pine Flat Mountain, Elk Camp Ridge, and Red Mountain, Rice (p.c. '55) (S.M.B. 21675).

El Dorado County: **2,** In laterite soils from the Pilliken Chrome mine, W. B. Clark and Carlson (3) p. 438.

Tulare County: **1,** Specimen from veins represented as crystalline garnierite associated with chrysoprase in altered serpentine is in the collections of the California Division of Mines (S.M.B. 21575). **2,** Garnierite occurs as irregular veins in silicified serpentine at Venice Hill and near Porterville, Rice (p.c. '55).

* GERSTLEYITE, 1956
$(Na,Li)_4As_2Sb_8S_{17} \cdot 6H_2O$

Hydrous sodium lithium arsenic antimony sulfide. Color: Cinnabar-red, platy, fibrous spherules in clay. Luster: weakly adamantine. H. = 2.5. G. = 3.62. Monoclinic (?). Cleavage perfect (010) and (100), poor (001).

Kern County: **1,** This new mineral is described by Frondel and Morgan (7) p. 839, from Kramer borate district. It occurs in the workings of the Baker mine as cinnabar-red to blackish-red spherules, up to an inch in diameter, with a crudely radial fibrous structure. It also occurs as granular aggregates and group of small thick plates.

GINORITE
$Ca_2B_{14}O_{23}\cdot 8H_2O$

Monoclinic (?), flat tablets, dense masses; one cleavage; H. = 3½; G. = 2.09; color white; transparent in small grains.
Cleavage flakes are lozenge shaped with angles 80° and 100°.

Inyo County: **1**, Ginorite is first reported from California from the head of Twenty Mule Team Canyon, Death Valley (SW¼ sec. 9, T. 26 N., R. 2 E., S.B.), from the Mott open-cut colemanite prospect. The ginorite occurs in white pellets embedded in a pale yellow-brown matrix of sassolite and clay, Allen and Kramer (6) p. 56.

GLAUCOPHANE
See amphibole

GOLD

Additional general reference: Anonymous (33), (35); Eric et al. (1).

Nevada County: **5**, A superb specimen of crystallized gold is reported to have been collected from a pocket in the Red Ledge mine, near Washington. The specimen was 1½ x 1½ inches, and is presumed to have been collected in September 1956, Anon. (32) p. 12.

Sierra County: **2**, Gold mining in Sierra County in the Alleghany-Downieville area is from the only currently producing lode property in the state. A good discussion of this activity is found in Carlson and Clark (3).

GRIFFITHITE

General reference: Faust (1).

GUMMITE

Kern County: **2**, Reported with autunite from the Buster Tom claims, 6 miles SSE of Tehachapi (sec. 8, T. 11 N., R. 14 W.), G. W. Walker et al. (5) p. 17. **3**, From the Embree property near Bodfish, but lacking positive identification (S.M.B. 21617), G. W. Walker et al. (5) p. 31. **4**, Tentatively identified from the Jumpin claim, with autunite (secs. 9, 10, T. 9 N., R. 13 W., S.B.) 5½ miles WNW of Rosamond, G. W. Walker et al. (5) p. 15. **5**, Tentatively identified with autunite from the Rosamond prospect (SW¼ sec. 25, T. 10 N., R. 13 W., S.B.) 10 miles S of Mojave, as coatings in tuffaceous sedimentary rocks, G. W. Walker et al. (5) p. 15.

Sonoma County: **1**, Questionable identification from Bodega Head (S.M.B. 21646).

HALITE

General reference: A comprehensive discussion of all phases of salt (history, occurrence, mining, purification) is contained in Ver Planck, (4).

HALOTRICHITE

Mono County: **1**, Chemical analysis of halotrichite from the Pacific Coast Pyrophyllite mine, White Mts., California, is reported in Baur and Sand (1) p. 678.

HAMBERGITE
A basic beryllium borate
$Be_2(OH)BO_3$

Orthorhombic. In prismatic crystals. Color, grayish white. Cleavage, pinacoidal (010) perfect and (100) good. H. = 7.5, G. = 2.3.

San Diego County: **1**, This is the first reported occurrence of this rare beryllium mineral in the United States. Hambergite is reported from the workings of the Little Three mine near Ramona, and was discovered by Capt. J. Sinkankas, U.S.N. The mine is owned by Louis B. Spaulding, who screened the dump after the discovery, and recovered some crystals. The crystals come from a pocket and range in size from slivers up to 2 inches, Anonymous (36), p. 5.

HANKSITE

San Luis Obispo County: **1**, Knowlton (p.c. '57) reports hanksite crystals showing prism and pyramid, from Soda Lake.

HELIOPHYLLITE

See ecdemite

HEMATITE

Mono County: **3**, A contact metamorphic deposit occurs with magnetite northeast of the Black Rock mine, Casa Diablo Mt. quadrangle, Rinehart and Ross (1) p. 17.

HEMIMORPHITE

Inyo County: **4**, Occurs widely and in good crystals up to 5 mm in the Ubehebe mine; also in coarse-grained aggregates in cavities, McAllister (4) p. 27. **5**, Also occurs in the Lippincott mine, McAllister (4) p. 39.

Riverside County: **1**, Abundant prismatic crystals of hemimorphite lining cavities, and accompanying massive material has been found associated with smithsonite in sphalerite and galena-rich boulders on the old dump from the Lone Star quarry, Crestmore, Jenni (p.c. '57).

HILLEBRANDITE

$Ca_2SiO_4 \cdot H_2O$

Orthorhombic—habit fibrous; brittle; H. = 5.5; G. = 2.69. Color porcelain white.
Soluble in acid, leaving skeleton of silica.

Riverside County: **1**, Hillebrandite has been determined by X-ray methods to be distinct from foshagite and xonotlite, and accordingly foshagite is to be considered as a distinct mineral, Hiller and Taylor (1) p. 59.

HORNBLENDE

See amphibole

HOWLITE

Los Angeles County: **1**, Microscopic crystals were recently found at the old Sterling Borax mine, Tick Canyon, permitting confirmation of crystal data for this usually massive mineral, Murdoch (33) p. 521.

HYDROMAGNESITE

San Francisco County: **3**, Finely crystalline hydromagnesite occurs with xonotlite as veins in basalt at Marshall Beach, near Fort Point, Watters (p.c. '57).

HYDROZINCITE

Inyo County: **4**, Colloform linings of fine grain coat and fill cavities in the Ubehebe mine, McAllister (4) p. 27.

IDDINGSITE

Inyo County: **2,** Occurs as prominent alteration of olivine phenocrysts in the basalts of the Ubehebe quadrangle, McAllister (4) pp. 57, 59.

ILMENITE

Calaveras County: **1,** Ilmenite is a common minor constituent of graphitic schists in the Calaveras formation in the Calaveritas quadrangle, L. D. Clark (1) p. 6.

INDERITE

See kurnakovite

Hydrous magnesium borate $Mg_2B_6O_{11}\cdot 15H_2O$

Monoclinic. Fine prismatic needles and nodules. Occasionally in larger prisms well terminated. Luster vitreous. One perfect cleavage and another good. H. = 3. G. = 1.86.

Easily soluble in warm HCl. Readily fusible to a white bead. Gives off slightly alkaline water in closed tube. Occurs as crystals embedded in clay, associated with ulexite, borax, etc., in saline deposits.

Kern County: **1,** Inderite has been tentatively reported as occurring at two mines in the Kramer district. The mineral was first noted in a drill core, and subsequently in irregular masses and rough crystals at the Jenifer mine, Frondel and Morgan (7) p. 839. **2,** The mineral described by Frondel, Morgan, and Waugh (8) p. 927 as lesserite, has been shown by Ward Smith (p.c. '58) to be inderite. It occurs as prismatic crystals, sometimes with good terminations, associated with kurnakovite and other borates, in the mines at Boron in the Kramer district.

IRON

Riverside County: **1,** The Pinto Mountains stony (aerolite) meteorite (chondrite) (coord. = 1161, 337:) was recovered in November 1954 by V. Zimmerman while prospecting. The specimen weighed originally 39.5 lbs., and was the fourteenth verified meteorite from California. The specimen is preserved in the collections of the Institute of Meteoritics of the University of New Mexico, Albuquerque, N.M., La Paz (1), p. 295.

JADEITE

See pyroxenes

JAROSITE

Inyo County: **3,** Yellow crusts of tungsten-bearing jarosite are found in the Yaney mine (SW cor. sec. 22, T. 7 S., R. 32 E., M. D.) with ferberite (reinite), Bateman (3), p. 76. **4,** Small crystals are reported in cavities in massive jarosite from the east shaft of the Lost Burro mine, Ubehebe quadrangle, McAllister (4) p. 58.

KASOLITE

$3PbO\cdot 3UO_3\cdot 3SiO_2\cdot 4H_2O$

Monoclinic, crystals prismatic parallel to symmetry axis (b), sometimes radial groups; one perfect cleavage; H. = 4-5; G. = 5.9; color ocher-yellow to brownish yellow; streak ocher yellow; nearly white.

Soluble in HNO_3 with gelatinization.

San Bernardino County: **1,** From east of Twentynine Palms (S. M. B. 21630).

KERNITE

Kern County: **1,** Additional reference: Muessig and Allen (1) who describe a new borate near kernite (ezcurrite) from Argentina, and

comment on similarities to the Kramer occurrence; see also Muessig and Allen (2).

KURNAKOVITE
$Mg_2B_6O_{11}\cdot 13H_2O$

Triclinic. Crystals stout prismatic usually with rough faces; fair cleavages, two at 66°±; H. = 3; G. = 1.85; colorless, white; luster vitreous.
Fuses to white enamel; soluble in warm acids.

Kern County: **1,** Found abundantly locally in the Kramer district, in roughly formed prismatic crystals. This mineral was described by Frondel and Morgan (7) p. 839 as inderite, but has been shown (Ward Smith, p.c. '58), to be kurnakovite.

KYANITE

San Diego County: **1,** This is probably the same locality as *Imperial County,* **1,** since Imperial was at the time of the report of Friederich part of San Diego County.

LAUMONTITE

Partially dehydrates with great ease to a powdery form called leonhardite, B-leonhardite or caporcianite.

Kern County: **1,** Laumontite was reported with its alteration product cementing a feldspathic sandstone from the Standard Oil Company of California well C.C.M.O. 4, No. 35, Tejon field, 30 miles southwest of Bakersfield. It was identified microscopically, Kaley and Hanson (1) p. 923.

LAWSONITE

Marin County: **1,** Additional reference, Chromy (1) p. 130.

Mendocino County: **3,** Poorly developed lawsonite crystals occur with glaucophane in a quarry 5.1 miles north of Longvale on U.S. 101, together with riebeckite and stilpnomelane, Watters (p.c. '58).

LAZULITE

Madera County: **2,** Scorzalite reported by Smerud and McDonald (1) p. 20, may be lazulite and, though unlikely, may be the same as the lazulite of locality **1** of this Bulletin.

LEONHARDITE
Partially dehydrated laumontite
See laumontite

This is a completely and readily reversible process, as leonhardite will take up water to return to laumontite. Do not confuse with leonhardtite ($MgSO_4\cdot 4H_2O$).

Kern County: **1,** Occurs as an alteration of laumontite in cement of a feldspathic sandstone of Miocene age from the 11,000 foot level of the Standard Oil Company's well C.C.M.O. 4, No. 35, Tejon field, 30 miles southwest of Bakersfield, Kaley and Hanson (1) p. 923. This is the first report of leonhardite from California.

LESSERITE
See inderite

LINNAEITE
Co_3S_4

Isometric; habit octahedral; cleavage imperfect cubic; H. = 4½-5½; G. = 4.5-4.8; luster metallic; color light to steel gray; streak black.
Easily fusible; soluble HNO_3 with separation of sulfur.

San Luis Obispo County: 1, Reported as microscopic isometric crystals in fractured vein quartz, altering to bieberite, from Klau quicksilver mine, Santa Lucia Range (sec. 33, T. 26 S., R. 10 E., M. D.), Woodhouse and Norris (6) p. 114.

MAGHEMITE

Shasta County: 1, Additional reference, Kinkel et al. (2) p. 119.

MAGNETITE

Del Norte County: 1, Crystals are reported from Gasquet (S. M. B. 21545).

El Dorado County: 3, With hematite at the Chaix prospect near Latrobe, in lenticular masses, Clark and Carlson (3) p. 437.

Mono County: 1, Additional reference to the Benton district, Rinehart and Ross (1) p. 17.

MARCASITE

San Luis Obispo County: 1, Occurs as sheaves of slender crystals in chalcedony vugs, and with occasional cinnabar crystals perched on millerite needles, from the Klau quicksilver mine (sec. 33, T. 26 S., R. 10 E., M. D.) Woodhouse and Norris (6) p. 114.

MARIPOSITE

Kern County: 1, Location in the Rand schist is NW $\frac{1}{4}$ sec. 10, T. 30 S., R. 40 E., M. D., Troxel (p.c. '57).

MELANITE
See garnet

MERCURY

San Mateo County: 3, From the Emerald Lake mine, near Redwood City with cinnabar, metacinnabar, and terlinguaite (?) (S.M.B. 21669).

MESOLITE

Kern County: 1, Silky fibrous aggregates of mesolite occur with other zeolites on fractures in basalt at Red Rock Canyon, Murdoch (p.c. '57).

METACINNABAR

San Mateo County: 1, From the Emerald Lake mine near Redwood City with mercury, cinnabar, and terlinguaite (?) (S.M.B. 21669).

METASTIBNITE

Sonoma County: 1, Metastibnite is reported to occur sparingly in siliceous sinter at The Geysers, Anon., (30) p. 426.

METATORBERNITE
$Cu(UO_2)_2(PO_4)_2 \cdot 8H_2O$

Tetragonal. Crystals square tabular, rosettes or sheaf-like aggregates; one perfect cleavage (001); rather brittle; H. = 2½; G. = 3.5; luster pearly (001) to vitreous; color pale to dark green; does not fluoresce.

Imperial County: 1, Metatorbernite has been tentatively identified from the Lucky Katy claims on the southwest flank of the Chocolate Mountains (sec. 7, T. 9 S., R. 14 E., S. B.). The occurrence is as coat-

ings on fractures, and disseminated in country rock with quartz and iron oxides, G. W. Walker et al. (5), pp. 10, 26.

Inyo County: **1,** Reported from the County (S.M.B. 21619).

Kern County: **1,** Tentatively identified from shear zones in volcanic and granitic rocks as coatings, with ferrimolybdite and molybdenite from the Silver Lady claims in Jawbone Canyon, 20½ miles north of Mojave (sec. 10, T. 30 S., R. 36 E., M.D.), G. W. Walker et al. (5) p. 32.

San Bernardino County: **1,** From the County (S.M.B. 21629).

Tuolumne County: **1,** Reported from east of Yosemite Valley (S.M.B. 21620).

METAZEUNERITE

$Cu(UO_2)_2(AsO_4)_2 \cdot 8H_2O$

Tetragonal; crystals square tabular, acute pyramidal; (001) usually only smooth face; cleavage (001) perfect; H. = 2½; G. = 3.64; luster pearly (001), to vitreous; color grass green to emerald-green; fluoresces yellow-green.

Nevada County: **1,** A primary uranium mineral tentatively identified as metazeunerite occurs in the Truckee Canyon group of claims 13 miles E of Truckee, near Highway 40 (sec. 13, T. 18 N., R. 17 E., M. D.), as minute cavity fillings in a shear zone in granodiorite, G. W. Walker et al. (5) p. 28.

Plumas County: **1,** Reported from the Chilcoot area (S.M.B. 21608). G. W. Walker et al. (5) p. 28, describes the Perry Jones group of 61 claims in sec. 13, T. 24 N., R. 16 E., and in sec. 18, T. 24 N., R. 17 E., D. M., where "metazeunerite or torbernite" occurs in quartz vein material. The property is reached by road 4.6 miles north from Chilcoot.

MILLERITE

San Luis Obispo County: **2,** Reported with small euhedral cinnabar crystals in vugs in gouge and breccia in serpentines, from the Klau quicksilver mine (sec. 33, T. 26 S., R. 10 E., M.D.), in the Santa Lucia Range. Linnaeite, marcasite (previously reported as pyrite), and alterations morenosite, bieberite, epsomite, and several iron sulfates are associated. The millerite occurs as sheaves of slender crystals, Woodhouse and Norris (6) pp. 113-115.

MOLYBDENITE

Kern County: **6,** G. W. Walker et al. (5) p. 32, report molybdenite from the Silver Lady claims, probably confirming **5,** Murdoch (p.c. '50).

MONAZITE

Riverside County: **10,** An unidentified mineral probably monazite is sparsely distributed in biotite gneiss at the Desert View claim (sec. 31, 32, T. 5 S., R. 10 E., S. B.) about 2 miles N. 25° W. of Cactus City, G. W. Walker et al. (5) p. 26. **11,** Also found in sands in the Live Oak Tank area in the Joshua Tree National Monument, 12 miles S of Twentynine Palms, G. W. Walker et al. (5) p. 25.

San Bernardino County: **3,** Suggested as the mineral which causes radioactive reactions in the Uranus Claims SW of Pinto Basin (sec. 6, T. 2 S., R. 10 E., S.B.), occuring in biotite-rich portions of the Pinto gneiss, G. W. Walker et al. (5) p. 25. **4,** Thorium-bearing monazite is tentatively identified as occurring in the Homestretch group of claims

near Copper Mt., (sec. 19, 30, T. 1 N., R. 8 E., S.B.) in granitic rocks, G. W. Walker et al. (5) p. 25. **5,** Anomalous radioactivity in the Lucky Seven claim (sec. 18, T. 2 N., R. 4 E., S.B.) is attributed to thorium-bearing allanite and monazite in biotite pods in granitic rock, G. W. Walker et al. (5) p. 24. **6,** Abnormally high radioactivity in the Mountain Pass area is largely due to thorium in thorite and monazite in the bedrock of the area, G. W. Walker et al. (5) p. 22. **7,** Tentatively identified from the Original and Pack Saddle claims in granitic rocks (T. 6 N., R. 13 E., S.B.), G. W. Walker et al. (5) p. 13. **8,** Irregular crystals of iron-stained monazite occur in a pegmatite at the Rainbow group of claims in the Solo district, 12 miles S. 69° E. of Baker, with thorite crystals, G. W. Walker et al. (5) p. 22. **9,** Suggested by G. W. Walker et al. (5) p. 24, to be the source of radioactivity in the Steiner claims (sec. 31, T. 2 N., R. 7 E., S.B.).

MONTMORILLONITE

General reference: Pask and Turner (1).

MORENOSITE

San Luis Obispo County: **1,** Reported with marcasite from the Klau quicksilver mine, Woodhouse and Norris (6) p. 114.

* NEKOITE, 1956

Hydrous calcium silicate, $Ca_2(Si_4O_{10})\cdot 4H_2O$

Triclinic. Finely fibrous and acicular; one perfect cleavage; cluster pearly. Color snow white; H. = 4½-5; G. = 2.2-2.3.
Fuses to a glass and colors flame reddish. Soluble in HCl with slight gelatinization; gives off water in closed tube. A dimorphous form of okenite, with essentially the same composition but with different optical and X-ray properties.

Riverside County: **1,** A white fibrous mineral from Crestmore, determined by Eakle and Rogers (13) p. 266 as okenite, has been shown by Gard and Taylor (1) to be a new mineral, and christened nekoite.

PEROVSKITE

Riverside County: **2,** An additional variety of perovskite, in dead black cubes and cubo-octahedra, has been found in the 910 ft. level of the Commercial quarry, Crestmore, associated with brown octahedra of spinel, and colorless diopside, in calcite, Murdoch (p.c. '57).

PLOMBIÈRITE

A hydrated calcium silicate, near $CaSiO_3\cdot 2H_2O$

Opaline in character. Soluble in HCl with separation of silica. White to yellowish in color. Hardness 3-4.

Riverside County: **1,** Calcium silicate hydrate 14 Å has been detected by X-ray methods in specimens from Crestmore, intergrown with tobermorite minerals and wilkeite, Hiller and Taylor (1), p. 32. This is a compound they consider to be probably plombièrite, although they state that the character of the original plombièrite is uncertain. In any case, the X-ray powder pattern of the Crestmore mineral does not match that of plombièrite from Scawt Hill, Ireland, which does physically agree well with the description of the original mineral. The identity of the Crestmore material with type plombièrite must thus still be considered dubious.

PLUMASITE (rock)

See corundum

PLUMOSITE
See jamesonite

POWELLITE

El Dorado County: **1,** Reported with molybdenite from the Cosumnes Copper mine, Clark and Carlson (3) p. 437.

PREHNITE

Inyo County: **2,** White prehnite in crystalline grains up to 2 mm in length occurs with contact metamorphic minerals in a contaminated border zone in the Nelson Range, Ubehebe quadrangle, McAllister (4) p. 59.

Riverside County: **2,** Prehnite occurs in bands of radiating prismatic clusters in massive contact rock at the Jensen quarry, Schwartz (p.c. '57).

PRICEITE

General reference: Kramer and Allen (5).

PYROMORPHITE

Riverside County: **2,** Minute yellow crystals of pyromorphite have been collected at the Old City quarry, Riverside, Jenni (p.c. '57).

PYROPHYLLITE

Mariposa County: **1,** Additional reference, Bowen and Gray (2) p. 219.

Mono County: **2,** Pyrophyllite has been shipped from a deposit 17 miles north of Laws, California Division of Mines, Mineral Information Service, April 7, 1947. This is incorrectly reported from Inyo County, in Bulletin 173.

PYROXENES
Jadeite

General reference: Occurrence of jadeite in Franciscan cherts in several graywackes has been reported from Contra Costa, Sonoma, and San Benito Counties. The conclusion is offered that jadeite-bearing rocks may be widespread in California in the Franciscan series, Bloxam (1) p. 488.

Sonoma County: **1,** Additional reference to crystals, Dietz, Ralph W. (1) p. 20.

PYRRHOTITE

Trinity County: Additional reference, **1,** Island Mountain Copper mine, Stinson (1) pp. 9-33.

QUARTZ

Amador County: **6,** Interesting quartz crystals are found near the town of Mokelumne Hill, off the road to Glencoe, as clear crystals, individually and in groups. Detailed description of locality in Owens (1) p. 578.

Fresno County: **1,** Smoky quartz crystals were reported from miarolitic cavities in an alaskite (granite), from the Dinkey Lakes region by Hamilton (1). The mineral has been studied further by Cohen (1) and by Marshall (1).

Plumas County: **3,** Quartz in pegmatitic granite, with quasi-cleavage has been described from Plumas National Forest, 3 miles east of the junction of Indian and Squaw Creeks, Halden (1) p. 38.

Chalcedony

Riverside County: **1,** Chalcedony with high iridescence when cut and polished has been found near Blythe. Specimens are botryoidal, with interlaminated minute layers of chalcedonic quartz alternating with limonitic and hematitic iridescent bands, which show upon polishing a beautiful color and a near fiery play of colors. A mining parcel is owned by Mr. Frank Ross of Blythe, who is developing the prospect for gem material as precious chalcedony, to be marketed under the name "Ross-jewel", Webb (p.c. '57).

REINITE
See wolframite

RIVERSIDEITE, 1917

Riverside County: **1,** A white fibrous compound called calcium silicate hydrate 9Å has been considered by Hiller and Taylor (1) to be most likely the same as the material described by Eakle as riversideite, and accordingly they believe it should be given this name. It has so far been identified from Crestmore only in admixture with residual wilkeite.

SABUGALITE
$HAl(UO_2)_4(PO_4)16H_2O$

Tetragonal. Thin tabular square crystals; perfect cleavage (001); H. = 2½; G. = 3.2; color yellow; fluoresces bright lemon-yellow. The meta-II form is very weakly fluorescent.

Lassen County: **1,** From Western Mining Corporation lease near Doyle (S.M.B. 21659).

SASSOLITE

Inyo County: **1,** Sassolite with ginorite (new to California) is reported by Allen and Kramer (6) p. 56, from the Mott prospect near the head of Twenty Mule Team Canyon in Death Valley. The mineral occurs as pale yellowish-brown masses with embedded ginorite.

SCAPOLITE

Inyo County: **2,** Scapolite occurrences are described from the Ubehebe area by McAllister (4) p. 60.

SCAWTITE

Riverside County: **1,** Additional references: Murdoch (31) p. 505; J.D.C. McConnell (2).

SCHEELITE

Additional reference: Bateman (3).

Marin County: **2,** Scheelite-bearing alluvium and scheelite in place on contacts of metamorphic rocks with quartz diorite intrusives have been found on Inverness Ridge on the Point Reyes Peninsula. Two properties have been explored, known as the Bender deposit, ¾ mile west of Sir Frances Drake Highway on the banks of the stream that enters Tomales Bay at Willow Point. Some scheelite crystals up to a quarter of an inch across have been found in place. The second property is known as the Noren deposit, at the junction of the Bear Valley Road

and Sir Frances Drake Highway, 1 mile from Point Reyes Station. These two alluvial occurrences and their bedrock associates probably are the same as the reported occurrence 1, shown as Anon. (17) p. 4, Ver Planck (3) p. 265.

Mono County: 3, Scheelite is widely distributed in the metamorphic rocks of the Casa Diablo Mountain quadrangle, north of Bishop. The Black Rock mine is the most productive of the mineral, Rinehart and Ross (1) p. 11.

Riverside County: 3, Considerable scheelite, associated with radiating black tourmaline needles, has been found in Temescal Canyon, near Corona, Knowlton (p.c. '57).

Tulare County: 5, Large quantities of well-formed crystals have been discovered at the Tyler Creek tungsten mine near California Hot Springs, Anon. (37) p. 6.

SCHROECKINGERITE
$NaCa_3UO_2(CO_3)_3SO_4F \cdot 10H_2O$

Orthorhombic, pseudo-hexagonal. Crystals flattened on (001), usually in minute scales, as rosettes or single crystals; greenish-yellow color. H. = 2½. G. = 2.7. One perfect cleavage; easily soluble in acid.

San Luis Obispo County: 1, As scaly aggregates in a decomposed plutonic rock from the Pozo district, Woodhouse (p.c. '57).

Ventura County: 1, From the northwest portion of county (S.M.B. 21613).

SCHWATZITE
See tetrahedrite

SCORZALITE

Madera County: 1, Reported from the west side of the Ritter Range, as gem material, Smerud and McDonald (1) p. 20. This may be identical with lazulite, Madera County: 1.

SEPIOLITE—Meerschaum

Riverside County: 2, Sepiolite has been found as brown-stained pellets in limestone in the Commercial quarry, Crestmore, Murdoch (p.c. '57).

SERPENTINE

Calaveras County: 2, Veinlets of chrysotile asbestos up to 1 mm thick are found in serpentine in the $S\frac{1}{2}$ $NE\frac{1}{4}$ sec. 2, T. 4 N., R. 13 E., M. D., L. D. Clark (1) p. 17.

SMITHSONITE

Riverside County: 2, Smithsonite, in globular grains and poorly developed crystals, has been found with galena and sphalerite in boulders, associated with hemimorphite, on the old dump of the Lone Star quarry, Crestmore, Jenni (p.c. '57).

SPINEL

Inyo County: 1, Confirmation of this occurrence is carried by McAllister (4) p. 61.

SPODUMENE

San Diego County: Additional general reference: 1, Sinkankas (1).

STIBICONITE

San Bernardino County: **2,** Questionably identified, with stibnite and cinnabar from Red Devil claim, Danby district, (NW¼ T. 6 N., R. 18 E., S. B.) about 12 miles SE of Essex, G. W. Walker et al. (5) p. 24.

STIBIOTANTALITE

San Diego County: **1,** Stibiotantalite is referenced as specimen No. 53-84-2 in University of Wisconsin collections, and is reported in a paper on general investigation of columbium and tantalum minerals from Mesa Verde (Table, p. 436), Hutchinson (1) p. 432. The correct locality is Mesa Grande (letter, Hutchinson to Univ. of Wisconsin to Webb, from Harvard Collection, 87843, 7/22/58).

STIBNITE

Inyo County: **5,** Reported by Bateman (3) p. 82, as "3½ miles SW of Bishop (SE cor. sec. 23, T. 7 S., R. 32 E., M. D.)". This is probably confirmation of the occurrence given by Tucker and Sampson (32). The stibnite occurs as localized stringers in a fault zone, sometimes with quartz and pyrite.

STILPNOMELANE

Marin County: **1,** Stilpnomelane is a common constituent of metacherts on Tiburon Peninsula, Rice (p.c. '55).

Mendocino County: **1,** Golden brown stilpnomelane occurs rather abundantly in a quarry 5.1 miles north of Longvale on U.S. 101, in glaucophane schist with riebeckite and lawsonite, Watters (p.c. '58).

San Benito County: **1,** Stilpnomelane occurs as bronze-colored plates in metamorphosed chert at north end of Glaucophane Ridge, Chesterman (p.c. '55).

Santa Clara County: **2,** Reported by Hutton (4) p. 608, from the San Juan Bautista mine (Hillsdale mine) southeast of San Jose, Oak Hill area.

TALC

Calaveras County: **1,** Talc occurs in many parts of the Calaveritas quadrangle, and from some areas it has been marketed in very small amounts, L. D. Clark (1) p. 17.

Imperial County: **1,** This is thought to be mica schist from the Bluebird mine and not talc as reported, Robert K. Foster (p.c. '58).

Inyo County: Additional general reference: Bateman (3) p. 83.

TERLINGUAITE
Hg_2OCl

Monoclinic; habit prismatic parallel to symmetry axis (010), also equant, powdery, massive granular; one perfect cleavage (101); brittle; H. = 2½; G. = 8.7; luster brilliant adamantine; color sulfur yellow, becoming olive green on exposure to light; transparent.
Heated in closed tube decrepitates violently and becomes red-brown.

San Mateo County: **1,** Reported, but with questionable identification, from Emerald Lake mine near Redwood City, with mercury, cinnabar, and metacinnabar, S. M. B. (21669).

TETRAHEDRITE

Schwatzite is mercury-bearing tetrahedrite.

Inyo County: **6**, Reported in traces as mercury-bearing (schwatzite), from the western part of Ubehebe Peak, McAllister (4) p. 61.

THOMSONITE

Los Angeles County: **2**, Specimens of thomsonite have been collected from the Sir' Kegian gem beds, Escondido Canyon near Acton, Bensusan (p.c. '57).

THORITE—Uranothorite

San Bernardino County: **1**, The Atomic Energy Commission collected samples of this mineral with uranothorite from the Copper Mt. claim, 8 miles NE of Twentynine Palms (sec. 19, T. 1 N., R. 8 E., S. B.), G. W. Walker et al. (5) p. 24. **2**, Reported as irregular crystals in a pegmatite in the Solo district, 12 miles S 69° E of Baker, with monazite, G. W. Walker et al. (5) p. 22. **3**, Radioactivity in the Mt. Pass area is largely attributed to thorium in thorite and monazite, according to G. W. Walker et al. (5) p. 22. **4**, Prospects east of Forest Home on Mill Creek, in tributaries known as Lost, Alger, and Falls Creeks, have yielded uranothorite in small dark brown grains and subhedral crystals in magnetite, biotite and allanite aggregates, Hewett and Stone (5) p. 104. **5**, The Atomic Energy Commission collected samples of this mineral from the Copper Mt. claim, 8 miles NE of Twentynine Palms, (sec. 19, T. 1 N., R. 8 E., S. B.), G. W. Walker et al. (5) p. 24.

TOBERMORITE

General reference: Gard and Taylor (2).

Riverside County: **1**, Tobermorite has been identified as pseudomorphous after wilkeite, at Crestmore, Hiller and Taylor (1) p. 34. This is the material called crestmoreite by Eakle (15).

TOPAZ

Inyo County: **1**, A single topaz crystal is reported to have come from near Saratoga Springs, Editors note, in Berkholz (17) p. 17.

TORBERNITE

Imperial County: **1**, Torbernite or autunite occurs with carnotite in the Lucky Star claims, 10 miles northeast of Glamis, (sec. 36 (?), T. 12 S., R. 19 E., S. B.), G. W. Walker et al. (5) pp. 10, 26. **2**, Torbernite (?) is reported from the Tenn-Cal group of claims (sec. 14, T. 12 S., R. 19 E., S. B.) in altered metamorphic rocks, associated with other yellow uranium minerals, G. W. Walker et al. (5) pp. 10, 26.

Kern County: **1**, Confirming Woodhouse (p.c. '45), G. W. Walker et al. (5) p. 19, report green platy torbernite with autunite from the Summit Range 6 miles north of Randsburg, in Red Mt. volcanics, Chilson Property (sec. 36 (?), T. 28 S., R. 40 E., M. D.). **2**, Reported with minor amounts of autunite in a shear zone on a granite contact with metasedimentary rocks (sec. 23, T. 27 S., R. 35 E., M. D.), 9½ miles SE of Weldon, G. W. Walker et al. (5) p. 31.

Plumas County: **1**, Torbernite or metazeunerite is described from the Perry Jones group of claims, 4.6 miles N of Chilcoot, G. W. Walker et al. (5) p. 28.

TOURMALINE

Riverside County: **7,** A pegmatite dike containing a tourmaline-bearing pocket from which about half a pound of gem quality red and green tourmaline was collected is reported from the Jensen quarry, Crestmore, Anon. (29) p. 141.

TYUYAMUNITE

$Ca(UO_2)_2(VO)_2 \cdot nH_2O$

Orthorhombic. Scales or laths or radial aggregates; crystals always small, sometimes with curved faces. Perfect micaceous cleavage. Not brittle. H. = 2. G. = 3.67-4.35. Luster adamantine, pearly on (001), massive material waxy. Color canary yellow to greenish yellow.

Occurs in veinlets in limestone, disseminated in sandstones (associated with carnotite) etc.

Madera County: **1,** This mineral was reported 28 miles from Mid Pine in Yosemite National Park by Dr. F. E. Tiffany of Mid Pine, in a clay seam between granite and slate. This was reported by the Mariposa Gazette on Oct. 6, 1949, G. W. Walker et al. (5) p. 38.

San Bernardino County: **1,** From near Adelanto, (S.M.B. 21626).

ULEXITE

Kern County: **2,** Additional references with chemical analysis, Baur and Sand (1) p. 678; on optical properties, Baur et al. (2) p. 697; and Ralph W. Dietz (2) p. 16.

URACONITE

Calaveras County: **1,** Additional reference, G. W. Walker et al. (5) p. 10, 28.

URANINITE

Calaveras County: **1,** Additional reference, G. W. Walker et al. (5) p. 10, 28.

Kern County: **1,** Reported with uncertain identification with gummite (?) and secondary yellow stains of other uranium minerals from the Embree property near Bodfish, G. W. Walker et al. (5) p. 31.

Madera County: **1,** A radioactive mineral in minute quantities, possibly uraninite, is reported from the Rainbow claim, Jackass district, (T. 4 S., R. 24 E., M.D.) 16 mi. SE of Camp Curry, G. W. Walker et al. (5) p. 29.

Riverside County: **1,** From near Twenty-nine Palms (S.M.B. 21637, 21639, 21640).

San Bernardino County: **2,** From the County (S.M.B. 21642). **3,** It has been suggested that pitchblende may be the source of radioactivity in the St. Patrick claim (sec. 7, 8, T. 1 S., R. 1 E., S.B.) G. W. Walker et al. (5) p. 23. **4,** Uraninite is probably the uranium-bearing mineral erratically distributed in masses of sulfide minerals at the Yerih group of claims (sec. 3, 4, T. 2 N., R. 1 E., S.B.) in crushed zones in limestone, in the Holcomb Valley district, G. W. Walker et al. (5) p. 23.

San Luis Obispo County: **1,** Associated with schroeckingerite and zippeite from the Pozo district, Woodhouse (p.c. '57).

Tuolumne County: **1,** From Radium No. 1 (S.M.B. 21643).

URANOPHANE

$CaO \cdot 2UO_3 \cdot 2SiO_2 \cdot 6H_2O$

Orthorhombic, in minute acicular prisms, radiated or stellate groups; also massive fine fibrous; H. = 2-3; G. = 3.81-3.9; luster vitreous, pearly (010); honey- to lemon- or straw-yellow.

Imperial County: **1,** From near Niland (S.M.B. 21625).

Kern County: **1,** From Jawbone Canyon (S.M.B. 21621).

Riverside County: **1,** From near Twenty-nine Palms (S.M.B. 21638).

San Bernardino County: **1,** From Kramer Hills (S.M.B. 21618).

VANADINITE

Inyo County: **2,** Crusts and cluster of small crystals lining cavities in limonite, commonly associated with wulfenite, are reported from the Ubehebe mine, McAllister (4) p. 62.

VEATCHITE

General reference: Kramer and Allen (5).

VERMICULITE

Riverside County: **2,** Vermiculite has been observed in a biotite-rich intrusive in the Little San Bernardino Mountains (sec. 9, T. 3 S., R. 6 W., S.B.), Proctor (p.c. '57). This occurrence produced a small amount commercially in 1940. **3,** It also occurs on the property of the Asbestos King mine, 15 miles southeast of Indio, Proctor, (p.c. '57).

VESUVIANITE

Inyo County: **7,** Occurs as coarse-grained crystalline masses and individuals in contact zones in marble in several places in the Ubehebe quadrangle, McAllister (4) p. 57.

VOLTAITE

Contra Costa County: **1,** Voltaite is reported from the Mount Diablo mine, in association with metallic sulphates, Watters (p.c. '57).

WOLFRAMITE

Reinite is a varietal name for iron-rich wolframite (ferberite) pseudomorphous after scheelite.

Inyo County: **1,** The tungsten mineral from the Monarch mine is probably ferberite, McAllister (4) p. 56. **3,** Confirming Bateman (p.c. '49), McAllister (4) p. 76. The pseudomorphs are known by the varietal name reinite, and are associated with jarosite rich in WO_3.

WULFENITE

Inyo County: **6,** Occurs widely distributed with other lead minerals in the Ubehebe mine, as thinly tabular, and minute elongate crystals, McAllister (4) p. 24; **7,** Wulfenite is an important mineral at the Lippincott mine, McAllister (4) p. 39.

XENOTIME

Riverside County: **3,** Reported in sands with monazite from Live Oak Tank area, 12 miles S of Twenty-nine Palms, G. W. Walker et al. (5) p. 25.

XONOTLITE

General reference: Dent and Taylor (1).

San Francisco County: **2**, Xonotlite occurs with hydromagnesite at Marshall Beach, near Fort Point, Watters (p.c. '57).

ZIPPEITE

$(UO_2)_2(SO_4)O \cdot nH_2O$

Orthorhombic (?)—fragile crusts and reniform or botryoidal coatings; also earthy; luster dull to silky; probably one perfect cleavage; color orange yellow; G. 3.7-4; fluoresces green.

San Luis Obispo County: **1**, Associated as orange yellow crusts with schroeckingerite from Pozo district, Woodhouse (p.c. '57).

ZIRCON

Los Angeles County: **1**, Additional reference, Patchick (2) p. 237. This paper gives detailed location diagrams.

Santa Barbara County: **1**, Zircon is a prominent constituent of sands along Hope Ranch Beach and in other sands of the Santa Barbara formation, Woodhouse (p.c. '57).

ZOISITE

Inyo County: **1**, Additional reference, McAllister (4) p. 63.

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Swinney, C. Melvin
4. See Eric, John H. (1) and Stromquist, Arvid A. (1).

Switzer, George
9. See Pabst, A. (15) and Sawyer, D. L. (2).

Taylor, H. F. W.
3. See **Dent, L. S.** (1).
4. See **Gard, J. A.** (1).
5. See **Gard, J. A.** (2).
6. See **Hiller, L.** (1).

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1. Pseudomorphism and zonal growth of garnets from Garnet Hill, California: Rocks and Minerals, vol. 20, no. 8, pp. 359-363, August 1945.
2. Green garnets-uvarovites: Rocks and Minerals, vol. 21, no. 10, pp. 652-655, Oct. 1946.
3. More on uvarovite garnets: Rocks and Minerals, vol. 22, no. 6, pp. 506-509. June 1947.
4. Eight recent garnet finds: Rocks and Minerals, vol. 22, no. 9, pp. 811-818, Sept. 1947, containing a section entitled "Grossularite from near Bishop, Inyo County, California."
5. Vicinal forms on garnets: Rocks and Minerals, vol. 23, no. 2, pp. 105-107, Feb. 1948.

Turner, Mort D.
1. See **Pask, Joseph A.** (1).

Ver Planck, William E.
3. Mines, mineral resources and mineral industries of Marin County, California: California Jour. Mines and Geology, vol. 51, pp. 221-289, 1955.
4. Salt in California: California Div. Mines Bull. 175, 168 pp., 1958.

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4. (and **Griggs, Allan B.**) Chromite deposits of the southern Coast Ranges of California: California Div. Mines Bull. 134, pt. 2, chap. 2, pp. 40-88, 1953.
5. (**Lovering, Tom G.**, and **Stephens, Hal G.**) Radioactive deposits in California: California Div. Mines Special Rept. 49, 38 pp., 1956.

Watters, Lu
1. Notes on some shoreline minerals of San Francisco, California: Rocks and Minerals, vol. 28, nos. 11-12, pp. 563-566, Nov.-Dec. 1953.
2. Notes on the glaucophane schists of the California Coast Ranges: Rocks and Minerals, vol. 30, nos. 11-12, pp. 572-577, 1955.

Waugh, J. L. T.
1. See **Frondel, Clifford** (8) and **Morgan, Vincent** (2).

Wells, Francis G.
5. (and **Cater, Fred W., Jr.**, and **Rynearson, Garn A.**) Chromite deposits of Del Norte County, California: California Div. Mines Bull. 134, pt. 1, chap. 1, pp. 1-76, 1946.
6. (and **Cater, Fred, W., Jr.**) Chromite deposits of Siskiyou County, California: California Div. Mines Bull. 134, pt. 1, chap. 2, pp. 77-127, 1950.

Woodhouse, C. D.
6. (and **Norris, R. M.**), A new occurrence of millerite: Am. Mineralogist, vol. 42, pp. 113-115, 1957.
7. (and **Norris, R. M.**), Nickel and mercury minerals at Klau: Gems and Minerals, no. 234, pp. 18-20, March 1957.

CORRECTIONS AND ADDITIONS TO BULLETIN 173

Page 9 paragraph 3, line 10. For George Tunsell, read George Tunell.

Page 31. Kroehnkite should read kröhnkite.

Page 31. Ferrinitrite should read ferrinatrite.

Page 31. Siderotile should read siderotil.

Page 32. The basic classification of silicates as given here is from Elements of Optical Mineralogy, pt. 2, 4th ed., 1951, by A. N. Winchell, and not from Mineralogische Tabellen, by H. Strunz, in Akad. Verlag Becker & Erler Com, Ges. Leipzig, pp. 36-49, 1941.

Page 32. Ferrisicklerite should read ferri-sicklerite.

Page 33. Inosillcates should read inosilicates.

Page 34. Olivene should read olivine.

Page 40. Amianthus is a term sometimes used for any silky amphibole, as well as serpentine.

Page 46. Read "ANALCIME-Analcite".

Page 47. The locality listed under *San Benito County* is in *Fresno County*, and is listed as Fresno County, 1.

Page 64. Antunite, Kern Co., 2, read G. W. Walker (3).

Page 109, Chloropal. Nontronite is preferred as the mineral name.

Page 118. The description of New Idria mine given here is not properly of the mine itself, but rather of central San Benito County. The general geologic setting of the mine is to be found in Eckel, E. B., and Myers, W. B., (2), pp. 81-124, cited in the bibliography.

Page 144. Ellestadite, read "Duncan" McConnell.

Page 151. Siskiyou County occurrence of fayalite is near *Cougar* Butte, not Canyon Butte.

Page 161, *Riverside County*. Galena was reported from the Black Eagle mine in the Eagle Mountains by Tucker (8), p. 195, as "cuproplumbite." Since then the two have been shown to be identical. (See cuproplumbite).

Page 161, *San Mateo County*. The 30-inch vein reported is a quartz vein with some galena.

Page 164. Garnet, Kern County, 2, read Los Angeles County, 1.
Garnet, Kern County, 3, read: 2.

Page 167. Gay-lussite should read gaylussite.

Page 177. Griffithite has been determined to be a member of the montmorillonite group. Faust, G. T., Thermal analysis and x-ray studies of griffithite: Washington Acad. Sci. Jour., vol. 45, no. 3, pp. 66-70, 1955.

Page 181. Chemical formula for hanksite should read $Na_{22}K(SO_4)_9(CO_3)_2Cl$.

Page 181. Reference for lazulite in Kern County. Change *Fahiz* to read *Fahey*. Also, add to bibliography the following complete reference: Pecora, W. T., and Fahey, J. J., 1950, The lazulite-scorzalite insomorphous series: Am. Mineralogist, vol. 35, nos. 1-2, pp. 1-18.

Page 183. Hematite: after "specular hematite"
Add: or *specularite*.

Page 193. Inderite = kernakovite
"lesserite" = inderite

Page 203, *Mendocino County*. The fine pink crystals referred to are at Syke Rock.

Page 210. Magnesiocopiapite should read magnesio-copiapite.

Page 234, Montmorillonite. Griffithite is also a member of the montmorillonite group; see griffithite.

Page 242. Okenite. See nekoite.

Page 248, line 2, delete "the only other known occurrence in the United States . . . Massachusetts."

Page 266. Pyrochlore, San Diego County; "h" omitted from pyrochlore.

Page 269. Pyrophyllite, Inyo co., 2, read Mono County, 1.

Page 272. *San Francisco County*. The locality referred to is in the city of San Francisco along the shore about half a mile south of Fort Point.

Page 282. The term reinite is omitted from this page. See wolframite; reinite is used for pseudomorphs of ferberite after scheelite.

Page 284. Trinity County should precede Tuolumne County.

Page 286. Römerite should read roemerite.

Page 288, *San Benito County*. The citation is improperly given as Walters; please read Watters.

Page 289. Sal ammoniac should read salammoniac.
Page 307, *San Benito County.* The spinel has been found in place half a mile upstream from the benitoite locality; only float is found downstream.
Page 311. Contra Costa Co., delete (N.R.), read C. P. Ross (2) p. 41.
Page 328. Tinstone, read "Tin Stone."
Page 329, line 5. Read J. D. C. McConnell.
Page 345. Reinite is a name used for pseudomorphs of ferberite after scheelite.
Page 355. Add: Acta Crystallographica (Copenhagen). 1948+.
Page 392. Glass, Jewel J. read "Jewell."
Page 403. Kessler, H. H. (1), read "Dehesa".
Page 404. Kramer, H. C. (2), See Allen, R. D., add (2)
Page 440. Switzer, George (8), add: (and Bailey, E. H.)

INDEX TO BULLETIN 173

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ARRANGED BY COUNTY

Compiled by ELIZABETH COLLINS
California Division of Mines

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